



IFW

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Norihiisa NAKAGAWA et al.

Group Art Unit: 3747

Application No.: 10/581,189

Filed: June 1, 2006

Docket No.: 128241

For: AIR-FUEL RATIO CONTROL APPARATUS OF INTERNAL COMBUSTION ENGINE

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 CFR § 1.56, the attention of the Patent and Trademark Office is hereby directed to the reference(s) listed on the attached PTO-1449. Unless otherwise indicated herein, one copy of each reference is attached. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the reference(s) be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

- ☒ 1. This Information Disclosure Statement is being filed (a) within three months of the U.S. filing date of this non-CPA application, OR (b) before the mailing date of a first Office Action on the merits in the present application. No certification or fee is required.
- ☒ 2. A concise explanation of the relevance of one or more non-English language reference cited herein appears in the Appendix attached. See References 1 and 2.
- ☒ 3. An English language Abstract of one or more non-English language reference is attached. See References 1 and 2.
- ☒ 4. A computer-generated English language translation of one or more Japanese Patent Publication cited herein has been obtained from the website of the Japanese Patent Office (<http://www.jpo.go.jp>), and is attached, but has not been reviewed for accuracy. See References 1 and 2.

Respectfully submitted,

James A. Oliff  
Registration No. 27,075

Jeffrey R. Bousquet  
Registration No. 57,771

JAO:JRB/cjw  
Date: May 23, 2007

OLIFF & BERRIDGE, PLC  
P.O. Box 19928  
Alexandria, Virginia 22320  
Telephone: (703) 836-6400

**DEPOSIT ACCOUNT USE  
AUTHORIZATION**

Please grant any extension  
necessary for entry;  
Charge any fee due to our  
Deposit Account No. 15-0461



Sheet 1 of 1

Form PTO-141 (REV. 1/06)		US Dept. of Commerce PATENT & TRADEMARK OFFICE		ATTY DOCKET NO. 128241		APPLICATION NO. 10/581,189	
INFORMATION DISCLOSURE STATEMENT  (Use several sheets if necessary)				APPLICANT(S) Norihisa NAKAGAWA et al.			
				FILING DATE June 1, 2006		GROUP 3747	
U.S. PATENT DOCUMENTS							
Examiner Initials	Cite No.	Document Number	Date	Name			
FOREIGN PATENT DOCUMENTS							
Examiner Initials	Cite No.	Document Number	Date	Country	With English Abstract	With English Translation	
	1	JP A 2003-49681	02/21/2003	JAPAN	X	X	
	2	JP A 9-303182	11/25/1997	JAPAN	X	X	
OTHER DOCUMENTS							
Examiner Initials	Cite No.	(Including Author, Title, Date, Pertinent Pages, etc.)					
EXAMINER					DATE CONSIDERED		
Examiner: Initial if citation considered, whether or not citation is in conformance with M.P.E.P. 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							

Date: May 23, 2007

## APPENDIX

JP 2003-49681-A discloses an exhaust emission purifying device which includes a storage/reduction type NOx catalyst and a three way catalyst arranged as a front-end catalyst upstream of the NOx catalyst. The device executes a rich spike control for reducing NOx stored in the NOx catalyst, and executes a lean spike control for controlling to keep the air/fuel ration of exhaust emission leaner than the theoretical air-fuel ratio in a given time period after the completion of the execution of the rich spike control, so that good amount of oxygen is stored in the three way catalyst to improve the ability to purify hydro carbon and carbon monoxide. Furthermore, the device controls the amount of oxygen flowing into the three way catalyst does not exceed the O2 storage capacity of the catalyst during the lean spike control. This control is also executed to purify the exhaust emission.

JP 9-303182-A discloses an exhaust emission control device which controls an air-fuel ratio of air-fuel mixture to a target level leaner than the theoretical air-fuel ratio during the idling of an engine, such that oxygen is stored in a catalyst to prevent generation of hydrogen sulfide. The device enriches the air-fuel ratio of air-fuel mixture when an intake air amount during the idling of an engine exceeds a given amount. Accordingly, the device is able to prevent generation of hydrogen sulfide prior to the start of a vehicle and to prevent degradation of exhaust emission. Furthermore, the device suppress the enrichment control when the temperature of the catalyst exceeds a given temperature. We also note that JP 9-303182-A has a corresponding English patent publication US 5918583A, although we have not examined its equivalency to the Japanese publication.